S
333.91
W 31r 85
1976

OCT 25 '77

STATE DOCUMENTS

WATER USE IN MONTANA

The Role of Three Governmental Agencies

MUJWRRC Report No. 85

PLEASE RETURN

MONTANA STATE LIBRARY
930 East Lyndale Avenue
Helena, Montana 59601

Montana University Joint

Water Resources Research Center

MAR 14 '79
MAR 3 1 1993
Montana State Library
3 0864 1004 6973 6

ERRATA

MISSING PAGE 29 IS SIMPLY
A TYPOGRAPHICAL ERROR...
THERE IS NO MISSING PAGE.

WATER USE IN MONTANA

The Role of Three Governmental Agencies

MUJWRRC Report No. 85

Three Papers

presented at the

Third Annual Montana History Conference

sponsored by the

Council to Preserve Montana History

and the

Montana Historical Society

under a grant provided by the

Montana Committee for the Humanities

Helena, Montana

November 5, 1976

CONTENTS

Foreword

Roy E. Huffman, Vice President for Research, Montana State University

The Role of the State Water Conservation Board in the Development of Montana's Water Resources

D. P. Fabrick, Member of the Montana State Water Conservation Board, 1934-1949, 1953-1961

The Development of the East Bench Unit by the United States Bureau of Reclamation

Harold E. Aldrich, Regional Director, Region 6, United States Bureau of Reclamation, 1964-1973

Historical Development of Water Pollution Control in Montana

Claiborne W. Brinck, Director of the Division of Environmental Sanitation of the Montana State Department of Health, 1951-1972

Commentary

Norris Hundley, Jr., Professor of History, University of California at Los Angeles and Managing Editor of the PACIFIC HISTORICAL REVIEW

FOREWARD

The development and use of Montana's water resources have been a major concern of the citizens of the State beginning with the earliest days of settlement. Montana experienced the same series of Federal policies and programs as other areas of the West. They can be summarized as follows:

> The view that needed irrigation in the West could be accomplished by individuals. The vehicle provided was the Desert Land Act of 1877--a modification of the homestead and free land concept.
>
> Accomplishments under the Desert Land Act did not come up to expectations and the responsibility was passed to the States with enactment by the Federal Congress of the Carey Land Act of 1894.
>
> Development of water resources by the States also failed to meet national goals and the Congress gave the Federal Government a major role with enactment of the Reclamation Act of 1902.

Montana has experienced notable success in water resources development at all three levels of effort. Individuals and private groups have brought irrigation water to a significant acreage of land in Montana. Responding to the twin problems of drought and depression, Montana instituted an outstanding program of State-sponsored irrigation development in 1934 through the State Water Conservation Board. The Bureau of Reclamation activities in Montana developed the larger irrigation projects that added much to the water resources base of the State. Paralleling all of this was an early and continuing recognition by the State of the importance of maintaining water quality while providing the needed quantities of water.

The three authors of the papers in this publication represent a total of approximately 100 years of public service in Montana.

D. P. Fabrick spent most of his life as a farmer and rancher but he stands tall among the professional conservationists and water resources experts with whom he has worked. Harold E. Aldrich is a civil engineer by profession who was more than a "bureaucrat" as he worked with the people of Montana as an administrator of Bureau of Reclamation programs in the State. Claiborne W. Brinck is an environmental engineer by profession who became involved in the environmental aspects of water resources development and use in Montana long before the environment was a matter of general concern. All three of these men are officially retired but they continue their valuable contributions as in the three papers presented here.

Roy E. Huffman
Vice President for Research
Montana State University

December 31, 1976

THE ROLE OF THE STATE WATER CONSERVATION BOARD IN THE DEVELOPMENT OF MONTANA'S WATER RESOURCES

The subject assigned to me for this conference is the history of the Montana Water Conservation Board, its origin, problems, solutions and accomplishments.

In order to cover these several phases of this State program in the allotted time, we will be able to touch only on the highlights.

First, I will briefly relate the historic circumstances that led to the creation of the "Water Board", as it became generally called. Then I will summarize the scope of its construction program in order to materialize the subject before us.

In the 1930's, a national depression and a prolonged drought period hit Montana at the same time. We were not prepared for either. We had failed as a State to utilize the State's water resources which flowed out of the State unused and beyond our control. Large numbers of Montana citizens were compelled to sacrifice their lands and livestock and migrate to other States in the hope of making a new start. Abandoned farms and boarded-up store windows on mainstreets were the visible twin progeny of the drought. Most of the deserted farmlands became the property of the counties by tax foreclosures and were removed from the tax rolls. Bank failures were common. Widespread unemployment prevailed.

The use of our unemployed labor and of our unused water supplies, to build regenerative irrigation projects, was needed to rehabilitate our State and its people.

This challenge was accepted by our citizens. Governor F. H. Cooney called a special session of the legislature that passed the act providing

for the creation of the State Water Conservation Board. The Board had five members, the governor and the state engineer as ex-officio members, and three members appointed by the governor. The members of the original board were Governor F. H. Cooney, State Engineer J. S. James, and three appointed members, Richard Purcell, I. D. O'Donnell and D. P. Fabrick.

Shortly after the adjournment of the Special Session, in January, 1934, the Board met to formulate its program and policies. It was soon discovered that additional legislation was needed to provide lawful authority for specific phases of the proposed program. Supplementary legislation to broaden the authority of the Board and the scope of its program was prepared by the Board's counsel and presented to and was passed by the 24th regular session of 1935. Among other things, it provided:

1) That the Board shall be a body corporate with perpetual existence and be an agency of the State;

2) That it shall have authority to enter into any agreements with the President of the United States and with any agencies thereof;

3) Issuance of revenue bonds--such bonds not to be the liability or obligation of the State of Montana;

4) For the selling of bonds to any agency of the United States.

To further round out the rehabilitation and development program of the State, the Legislative Session of 1935 also created the State Planning Board, the State Electrification Authority, and the State Grazing Commission. The acts creating the first two agencies designated the Water Conservation Board also to be the State Electrification Authority and the State Planning Board.

These responses within the state to the triple problems of depression, unemployment and drought were paralleled on the national scene by the creation of the Public Works Administration, Works Progress Administration and the President's Drought Committee. These agencies offered financial assistance, which the State Water Conservation Board hastened to request.

In order to illustrate the broad scope of the State initiative to rehabilitate our basic agricultural economy, I am going to refer to a letter from the State Planning Board to the President's Drought Committee with lists of five groups of land use and water-use projects, together with our recommendation and request for allocation by the President of federal grants for employement.

List No. 1 included projects for which the Water Board had made application to the Public Works Administration for construction funds, estimated to provide 4,400,000 man-hours of employment;

List No. 2 included projects for which application was made to the Works Progress Administration for grants for employment, estimated to furnish 22,000 man-months of labor;

List No. 3 included W.P.A. water conservation and range improvement projects, sponsored by the State Water Board and by various local sponsorships;

List No. 4 included rural electrification projects for which application had been made to the federal Rural Electrification Administration;

List No. 5 included two groups of range improvement projects submitted to the State Planning Board by the State Grazing Commission and by the United States Forest Service for stock-water development and fencing for nine-million acres included in newly organized grazing districts and for a similar program within the National Forests of

Eastern Montana. It was stated in the letter to the President's Drought Committee that these regenerative projects "will furnish more permanent secondary employment in the future than will be employed in their construction."

One might wonder how it was possible to be ready within such a short time to submit to Federal agencies the plans for dozens of irrigation and land-use projects. Fortunately, the basic planning for this broad program had already been done during the late 20's and 30's by a group of citizens who had long recognized the need for the State Government to engage itself actively and directly in the development of our water resources. These men had the early support of the office of the State Engineer and of the irrigation committee of the Montana Chamber of Commerce, which committee later re-organized itself into the Montana Reclamation Association. The efforts of the Reclamation Association to create State-wide public support for a State water development program became successful when economic necessity provided the needed force that led to the call for a special session of the legislature. This special session created the State Water Conservation Board to carry on a construction program for irrigation projects in our semi-arid State.

Because of much preparatory planning done during the years prior to the creation of the Water Conservation Board, the construction program could commence almost immediately.

During the twenty-some active years of its construction program, the successive sessions of the legislature provided the needed supplementary funds to carry on the program.

By 1960, the Water Board had constructed or rehabilitated a total of 181 water conservation projects of which 44 are major projects, and

137 are small projects. Most of these small projects were built in co-operation with the Works Progress Administration and are located principally in Southeastern Montana counties.

These 181 projects have a total storage capacity for 438,000 acre-feet of water and additional 269,000 acre-feet can be furnished by direct diversions from the streams. This new water supply of 699,000 acre-feet will serve more than 400,000 acres of land. Eight-hundred and fifteen miles of canals and 78.5 miles of laterals were constructed.

The board made contracts for the sale of water with more than 2,000 separate water users.

Of the 44 major projects, nine are located in the Columbia Basin, thirteen in the Upper Missouri Basin above Fort Benton, twelve in the Lower Missouri Basin, and ten in the Yellowstone Basin.

The above 181 projects have been financed with funds from the sale of water conservation revenue bonds, amounting to $4,356,500; with cash grants from federal agencies of $3,569,477; with material and labor grants for $3,454,710; and with State appropriations of $10,490,523. The total cost of these projects is $21,871,210. Bearing in mind that a large share of these projects were built with ten-cent dirt and thirty-dollar concrete, this same group of projects would cost several times this amount today.

The principal projects of the Board were built under the program of the Public Works Administration. This involved the sale of revenue bonds to finance 55 percent of the cost of the projects, and 45 percent was in the form of a cash grant from that agency. Any additional funds over the amount allowed by the federal government for the construction of the projects was provided by state appropriations of $10,490,523. Another group of projects, ranging from the major Deadman's Basin Pro-

ject on the Musselshell down to a large number of small projects in Eastern Montana, were built in co-operation with the Works Progress Administration.

The Board's principal program was the construction of irrigation projects. However, it also furnished engineering to several Rural Electrification projects for the construction of 10,108 miles of line serving 12,774 customers, with a construction cost of $9,978,000. It also furnished engineering and supervision for building structures for many private irrigation companies in the state. The Board also furnished engineering and construction for five domestic water supply systems for local communities, where construction could be financed locally.

The Board was created to carry on a construction program. There was no desire on the part of the Board, nor would there have been support on the part of the people, to build up a centralized top-heavy agency. As a matter of fact, while there was continuous growth of the total program by the completion of additional projects, this State agency did not enlarge its staff or the number of its employees. This was made possible because the increase in project management, operation, and maintenance was almost entirely turned over to the local water-users organizations as soon as the construction of new projects was completed.

It was also the policy of the Board not to employ its own technicians to give assistance relative to the application of the water on the lands and other allied problems. The Board co-operated with and relied on such existing agencies as the Extension Service, the Experiment Station, the Soil Conservation Service, and others to provide the assistance needed by the individual farmer to properly use his irrigation water and to make suitable adjustment in his farming practices.

The work of the Water Board might be summarized by saying that (1) making an additional water supply of 700,000 acre-feet available for more than 400,000 acres of land has resulted in a substantial increase in agricultural production of food and feed crops; (2) it has provided a greater and more dependable winter-feed hay supply to balance our extensive summer grazing resources as has been so noticeable, for instance, in the Musselshell Valley, the Broadwater-Townsend Valley, the Smith River Valley, and the Ruby River Valley; (3) it has provided for greater stability and for the expansion of the livestock industry; (4) it provided needed employment during project construction, and it continues today and for the future to furnish secondary employment in the production, harvesting, marketing, processing, and transportation of expanded agricultural production; (5) it has provided a stronger and more stable economic base for many rural communities and towns; (6) it has provided greater security for many farm families to carry on during recurring drought periods; (7) it has broadened the tax-base to benefit all branches of local and State government; (8) it has successfully introduced a more practical method of financing, not only for the projects already constructed by the State Water Board, but also to become a pattern for future irrigation projects in the State; and, (9) perhaps most important of all, it has established additional vested prior rights for Montana to the use of 700,000 acre-feet of water that used to leave and be lost to the State, unused.

The above summary of the overall accomplishments of the state water development program should be supplemented by a statement on the local benefits derived from one of the projects of the Water Board.

Research Report No. 20 of the Department of Agricultural Economics and Rural Sociology of Montana State University, entitled "An Ecomonic

Analysis of Selected Montana State Water Conservation Board Projects," includes a twenty-two page analysis of the Ruby Valley Project. This project is typical of the major projects of the Water Board. The report was prepared by Elroy C. McDermot under the supervision of Professor Helmer C. Holje.

They obtained their facts from the records of the State Water Conservation Board, from the pertinent records of Madison County, from local observation in the field, and from personal interviews with water users and businessmen of the locality.

Following is the Summary and Conclusions of the report:

"1. Irrigation is of vital importance in stabilizing the economy of Madison County. It assures the production of sufficient winter feed to balance and stabilize the local livestock operations, from which the majority of the county's income is derived.

"2. One of the most important sources of irrigation water within the county is the Ruby River Storage Project. This project provides water to approximately 33,000 acres, of which approximately 20,000 receive a supplementary supply and approximately 13,000 receive a primary supply.

"3. The 'direct benefits' derived from the project in 1961 were approximately $319,258. This would represent average direct benefits of $9.67 per acre for the total acres being served by the project.

"4. The 'indirect benefits' generated by the project in 1961 were approximately $430,998.

"5. On lands reported by the water users to be of similar quality and fertility, the average difference in value between the irrigated land and land which presently is unable to be irrigated, was approximately $154 per acre. This difference in price should represent the capitalized value of net returns to the water discounted over time.

"6. The project has greatly reduced risk and uncertainty. Crops are now assured even in the driest years, and in normal years, production is reported to be approximately doubled on supplementary acres. The project has enabled many previously marginal operations to become stable economic units.

"7. The tax base of Madison County has been broadened considerably as a result of the Ruby River Project. It is assumed that the

13,000 acres of newly irrigated land was all previously classified as grazing land. The difference between the average assessed value of irrigated land and the average assessed value of grazing land was $23.28 in 1962. This average increase on 13,000 acres would amount to a broadening in the tax base of approximately $302,640. It is assumed that the 20,000 supplemental acres were all previously assessed as irrigated lands and have not been reclassified on the basis of additional water supply. No direct addition to the tax base has been attributed to them nor has any attempt been made to evaluate the indirect additions to the tax base, such as increased machinery and equipment, more improvements, and greater numbers of livestock. The state income tax base is also broadened by the direct and indirect benefits generated by the project.

"8. The local bank has enjoyed a period of steady growth during the life of the project. It was the opinion of the bank manager that the stabilizing effects of the project were a major factor in the steady growth of the bank, and of the local economy as well.

"9. The level of living of farm families in Madison County during the last three decades has been very favorable in comparison to the level for the state as a whole, and also the nation. This favorable position can be attributed largely to the balanced livestock operations and the increased production of irrigated crops. The Ruby project has contributed significantly to both.

"10. Every person interviewed, without exception, commented on the great worth of the project in stabilizing the local farming and ranching operations. Both users and non-users of project water were very cooperative in discussing their operations and the effects which they felt the project had upon their farm, ranch, or business. The general attitude towards the Ruby River Project was one of satisfaction and appreciation."

The following statements were made by both users and non-users of the project:

"Grover Goetschins: President of the Ruby River Water Users' Association. 'The dam has made farming in the area safe and dependable. It has been wonderful for the valley as a whole and was a godsend in 1961.'

"Lowell Soubier: Vice President of the Ruby River Water Users' Association. 'The project has been of great importance to the valley. New acres have been brought into production and yields increased on those already in production, with water. From Alder on down, you scarcely ever have a shortage in river water now.'

"L. W. Hansen: President of Vigilante Canal Users' Association. 'Considerable new ground was opened up when the project was put in. Some of this had been plowed years before but had gone back to sagebrush. The additional water provided by the project stabilized our ranches by making it possible to produce more hay.'

"Pat Burk: President of West Bench Canal Users' Association. 'There was little here before the project was put in. This place was under the ditch, but there was very little water available. The people in this area greatly appreciate the State Water Board and their activities. The whole area has benefited from the project.'

"Clark Raymond: A Director of the Ruby River Water Users' Association. 'This project has increased the carrying capacity of my ranch by 50 percent. I can now raise excellent hay on land that was previously sagebrush and greasewood. Three weeks after the water is turned in the canal, it finds its way back to the river. There is scarcely no such thing now as a low river. Before the project was put in, the river usually ran dry by the time it got to Sheridan.'

"Ben Hardin: Manager of local Soil Conservation Service office. 'The Ruby project has been vitally important in stabilizing the local economy. It has guaranteed a second crop of hay, where only one could be grown before. An average acre of this land would produce .2 of an A.U.M. without water, and three tons of alfalfa with water. This would be a difference in net return of approximately $17.50 per acre.'

"Ted Darby: Manager of the Bank of Sheridan. 'This Ruby Project has greatly benefited the whole valley. It has held the town together and reduced turnover considerably."

One more thing about the Ruby River project. Some of you undoubtedly have in mind the question of how much the State invested in this project, and how much of that investment has been repaid by the water users. The Ruby River Storage project is one of nine major Water Board projects that, at the end of fiscal year 1974, had more than repaid the full amount invested by the State in these projects.

Before closing this discussion on the origin of the State Water Conservation Board and on its accomplishments, it must be said that this program of the State to rehabilitate and expand our basic agricultural economy does not constitute a finished job or a completed program.

It was only a first phase of active leadership and direct participation by State government to expand the productive use of our great land and water resources. Instead of a periodic activity, the growth of our irrigated land base and the acquisition of additional vested water rights should be an active and continuous function of State Government in our semi-arid State.

Now that we have discussed the origin and the accomplishments of the State Water Conservation Board, let us turn our attention to another suggested subject, relating to the Board's problems and their solution.

We all know that a sound financial program is essential for the success of any enterprise. The first and the major problem of the Board was to formulate the financial arrangements for financing of the construction cost and for its repayment by the water users of the proposed projects.

Under the federal reclamation program of the Bureau of Reclamation, the repayment of the construction cost to the United States government was secured by the levies upon the lands of the district. This method of financing became generally accepted and was incorporated in the irrigation district laws of Montana and other western States.

This method had been found to be practical in the operation of federal irrigation projects, whose debts for the construction cost was owed to the United States government.

When early defaults occurred because annual repayments by the water users were required before full irrigated crop production had been developed, the Congress would, in one form or another, declare moratoriums granting to irrigation districts the right to delay meeting their repayment obligations and thereby protecting the districts from the legal consequences of default.

In the case of State irrigation districts where the bonds were held in private hands, this method of selling bonds, having as their security the lands of the district and holding every acre responsible for the entire debt, had been disastrous in many cases. This method created a lien upon all the farms of the district and made all the landowners jointly obligated for the entire construction cost. It made the success of the individual farmer dependent upon the success or failure of his neighbors.

In theory, this irrigation district method of financing was intended to facilitate the payment of bond levies. In practice, these repayment policies became a hindrance instead of help toward the success of State irrigation districts, as was demonstrated during the early 1920's.

The year 1919 is remembered for its severe drought. It created widespread activity in the State for organizing new irrigation districts. Many new districts were organized and bonded. Most of them failed and were abandoned soon after being constructed. When bond levies became due before sufficient irrigated crop-production became effective to produce sufficient income to pay district assessments, defaults occurred immediately.

The early delinquency on the part of some water users fed upon

itself by increasing the levies upon the land that had been paying. Total delinquency soon followed.

A pamphlet by Robert B. Tootell was published at that time analyzing the cause of this wide-spread failure of new irrigation districts which were basically feasible and could have proven successful with a more practical method of financing.

It was this experience of the early 20's that prompted the Water Board to search for and to introduce a new method for financing its proposed projects. The plan is simple; the fundamental thought being that the thing of value is the use of the water, and that any project making the use of water available should be paid for by a charge for such use.

Instead of being a general joint obligation, the charges are an individual obligation on the part of each farmer. This encourages individual enterprise, and the successful farmers become the leaders in the district and others will endeavor to follow their examples for their own benefit.

The plan introduced by the Water Board for financing its projects proved to be a better method. It became widely accepted as such by people in other States.

In order to see the role of the State Water Conservation Board in historical perspective, we must briefly review the history of water development.

Our review will deal specifically with water development originating with the people and government of Montana. It must be mentioned, however, that simultaneously with the developments on the state level

substantial and valuable contributions were made by the Bureau of Reclamation and by the Soil Conservation Service. The S.C.S. provided state-wide technical assistance for the rehabilitation of irrigation systems and for the more efficient distribution and use of irrigation water.

The State and Federal programs were not competitive nor duplicative; they were mutually supplementary to each other. The large projects, too big for State or local enterprise, naturally became part of the Federal program of the Bureau of Reclamation. The small projects of simple and low-cost construction were built by our pioneers. The medium-sized projects, too big for private enterprise and too small for the Federal program, became the type of projects suitable for the program of the State Water Conservation Board. Instead of competition, there has been a great deal of helpful cooperation between the Federal program, the State program, and private enterprise.

The history of the first hundred years of water development at the state level is marked by periods of active accomplishment, followed by periods of temporary slow-downs.

We have had three outstanding periods of active construction of irrigation systems. The first, and by far the most important, phase of irrigation developments in the State was accomplished by the private enterprise of our pioneer settlers. It followed the hard winter of 1886-1887, when more than half of the cattle died on the range. This marked the end of the livestock industry's total dependence on the open range for its feed supply. It furnished the impetus for irrigation development to raise hay for winter feed.

This may not be the place to do so, but I cannot avoid paying my respect and admiration to the good judgment and enterprise of our pioneers. They created 70 percent of the present irrigated area of the state. They did a remarkable job, remarkable for the soundness of its conception, remarkable for the short period in which it was accomplished, and remarkable for its practical realism in doing first things first. They chose and adopted irrigation as the means to produce a dependable winter feed supply, and to recover from the losses of the winter of 1886-1887. By doing so, they also advanced the economic development of the new territory and State.

When the opportunities for this type of simple and low-cost construction became exhausted, this first phase of water development had been successfully completed.

It was followed by a slow-down, until the severe drought of 1919 led to a revival of public interest in irrigation development. Many new irrigation districts were organized and constructed in the early 20's. Most of them failed because of unsound financial requirements for the repayment of the construction costs of the district.

This taught a valuable, if not costly, historic lesson that was remembered when more practical financial provisions were written into the law creating the State Water Conservation Board.

The third active period of irrigation development by the State Water Board followed the droughts of the early 30's. Similar to the first program by the pioneers, it resulted in expanding and stabilizing agricultural production.

We have seen that when our people have suffered the hardships of periodic unfavorable climatic conditions, they have, each time, reacted

with new irrigation programs for additional land and water use projects. They have demonstrated successfully that, of all programs to promote the growth and stability of Montana's basic agricultural economy, no program is more natural, more logical, more fundamental, more effective, or more widely beneficial than a well-balanced program of water development.

Historical review is always interesting. It is of little practical value, however, unless we remember to respond to its lessons. A review of the history of Montana's water development strongly suggests that we should carry on a construction program of irrigation development as a continuous function of State government.

I have appreciated that this subject was included for discussion at this conference. It indicates that our historians and our Historical Society realize the importance of water development for the welfare of our semi-arid State and for the economic security of its people.

D. P. Fabrick
Member of the State Water
Conservation Board from
1934-1949 and from 1953-1961

THE DEVELOPMENT OF THE EAST BENCH UNIT BY THE UNITED STATES BUREAU OF RECLAMATION

It was a pleasure to accept an invitation to visit with you today about the development of an irrigation project that I worked with from almost the moment it was thought about. The construction phase of this project presented the usual challenge to engineers and technicians; however, it is the associated and related problems leading up to the construction stage that are of particular interest and significance.

My familiarity with the courageous decisions, sacrifices, compromises and actions which were required to carry forward the development of the water resources in the Basin of the Three Forks in Montana stems from my service as Project Manager of the Upper Missouri District of the Bureau of Reclamation at Great Falls from 1947 to 1960. It was during this period that the project as now completed was envisioned and planned, the investigations were carried out, and construction was initiated.

Immense complexity is involved in carrying out the planning and development of a water-resource project. The problems that arise must be squarely faced and diverse interests must be unified. Today I will review some of the problems encountered in bringing surplus floodwaters to use in an area that for many years appeared to be faced with seemingly insurmountable obstacles in its quest for an adequate, assured water supply.

Because the people of Beaverhead River Valley had an awareness of their need and the courage, persistency and tenaciousness to solve their problems, water that would otherwise be wasted has been turned to the good for all of the valley.

The people of this region realized the need for irrigation not long after the famed Lewis and Clark expedition reached the area in 1805. Nearly as long as the area's historical association were its disputes, feuds, debates, legal actions and lengthy struggles over water rights. The first water right for irrigation of land in Beaverhead River Valley was in 1865 and the diversion of water from the river for irrigation purposes developed rapidly. Dry farming was taken up in earnest after the passage of the Enlarged Homestead Act of 1909. Settlement was highly encouraged, but the low rainfall and short growing season combined to discourage dryland farming operations.

Livestock ranching became the predominate agricultural pursuit. The ranchers utilized all of the water resources available for irrigation, and although efficient methods were employed, little additional acreage could be irrigated until storage was developed. The dryland areas, which were predominately the benchlands above the valley, were sparsely vegetated with native grasses and were used primarily for grazing. Many of the water users in the valley and owners of dry benchland were highly dissatisfied over the status of irrigation water supplies in the area and exerted considerable effort to alleviate the complicated water-supply situation. Several unsuccessful damsite drillings were made, but the engineering skills and money available were just not of sufficient quality or quantity to get the job done. The erratic nature of unregulated streamflow, disputed water allotments, inability to follow long-range farm plans and declining productivity resulting from haphazard irrigation practices combined to produce demands for definite actions toward finding the answers.

The unit, located in Beaverhead and Madison Counties, is approximately thirty miles long, ranges from one-half to seven and one-half miles wide and follows the northeastern course of the Beaverhead River Valley and adjacent benchlands. The town of Dillon is within the boundaries of the unit. Irrigation storage is provided by Hap Hawkins Reservoir located just below the junction of two streams--the Red Rock River and Horse Prairie Creek--which form the Beaverhead River.

The East Bench development came into existence as a part of the comprehensive, unified, and multipurpose plan conceived to meet the special needs of the Missouri River Basin, and indirectly, the entire Nation. The objective of the Missouri River Basin Project is to make the best use of the water and related land resources of the Missouri Basin. This comprehensive plan played a decisive role in the development of the East Bench Unit.

The legislation authorizing the Missouri River Basin Project erased two difficult problems which had prevented expansion of irrigation in the Basin of the Three Forks. Beaverhead Valley is located in this basin. The two problems were, first, the senior priority of water rights held by the Montana Power Company on the Missouri River below Townsend. These rights were such that they required the entire riverflow during dry years. Second, the landowners could not pay the entire cost of constructing irrigation works in forty years as required by Reclamation Law.

Construction of the Canyon Ferry Unit of the Missouri River Basin Project took care of the first problem. This unit, completed in 1954, was the key to the development of the resources of the Upper Missouri River Basin. In addition to flood control, the generation of electric

power, furnishing municipal water, serving irrigation and being a recreational mecca, the structure regulates the flows of the Missouri River so that new irrigation can take place without interfering with existing downstream water rights. Through the storage of winter and flood flows in Canyon Ferry Lake and regulation of the river to satisfy downstream water rights, it is possible to provide additonal storage on upstream tributaries and to divert water for additional irrigation without encroaching upon prior water rights.

The second problem was removed through the Flood Control Act of 1944, authorizing the Basin-wide use of power revenues to repay the irrigation construction cost that could not be paid by water users. The interdependence of power and irrigation in the Missouri River Basin Project is an important element of water-resource development in Montana and the Missouri Basin as a whole. The Missouri River Basin Project contemplates that feasible irrigation units shall be paid for by the irrigators to the extent of their ability. For the Project, at that time about 19 percent of the irrigation cost was to be paid by the irrigators in fifty years and 81 percent by power. For the East Bench Unit, the irrigators contracted to repay about 17 percent of the cost allocated to irrigation. Costs assigned to fish and wildlife and flood control are nonreimbursable.

None of the problems encountered in bringing water to Dillon Valley was as large or more complicated than that of water rights. There was no doubt that there were more water-right filings than there was water. Most of these rights had been established through lawful and beneficial use; however, there were the so-called outlaw ditches. These outlaw ditches were numerous, but had continued for so long that recog-

nition had to be granted their continued presence.

It was an intricate process to satisfy all of the existing water users in Beaverhead Valley. These consisted of: (1) persons whose rights had been adjudicated by the courts, (2) persons who had legal rights by filing and established use, (3) persons who had filed rights and not diverted water, (4) those who had established water rights by use without filing, and (5) those who had outlaw ditches.

A major difficulty encountered was that most people, regardless of their rights, were all using excessive amounts of water. Our findings showed sixty operating canals with water filings totaling 1,057 c.f.s. endeavoring to irrigate from a river with an annual peak flow often less than that. Because most operators knew that as soon as the June rise ended their supply would be cut off, everyone diverted at maximum rate for the few days or weeks that water would be available. Whereas the annual water requirement is four feet, Beaverhead Valley was taking five and one-half feet and many were still out of water for two or three months each year.

There was no doubt that enough water was available. It had only to be regulated and diverted at a usable rate. In fact, there was a full supply for the 28,000 acres already using some water and enough left over to supply another 21,800 acres of undeveloped land. The objective was to bring all diverse interests and factions together and try to satisfy all persons. A program had to be undertaken that would enable all factions involved to resolve differences and to understand that the entire community would benefit through the limitation of their use of water to a reasonable figure throughout the irrigation season. If this

dilemma could be resolved, endless lawsuits would be avoided, and everyone would be provided a full water supply.

It was obvious that the only way the problem of water rights was going to be solved was through a program of education based upon community spirit and action. The first step was to organize a series of get-togethers between a selected group of individuals, who had the overall interests and future of the valley at heart, and the Reclamation officials.* All of the physical details of the unit available at that time were explained to these individual groups. Question-and-answer sessions were held and the general proposals for the development were quickly discernable to this group. These discussions resulted in an enthusiastic representative cross-section of landowners forming a nucleus that undertook the task of explaining the plans for development to their neighbors.

A series of public meetings were initiated and from these meetings the development of Beaverhead Valley's water resources was organized. Twenty directors were elected from representative parts of the Unit to promote the completion of investigations and an early presentation of a formal plan.

The big question now at hand was what kind of organization could be formed to effectuate the regulation of the Beaverhead River waters. First of all, there were many farmers and ranchers in the valley who

---

*W. W. (Hap) Hawkins (dec.) (reservoir at Clark Canyon Dam named after him) was the organizational inspiration. Carl Davis was the Attorney and Secretary for the original group. Original incorporators of Clark Canyon Water Company were: L. G. Staudenmyer, Peter W. Rebish, Herbert W. Wheat, Harry Tash (dec.), Edger Ferris, De Mar Taylor, Phillip B. Cottam (dec.), Elmer W. Petersen, A. R. Smith (dec.), and C. J. Cox. (They were all also early leaders in the organization effort.) Holger Carlson and Maynard Nyhart were also members of the early group.

flaty refused to organize into an irrigation district. Their reasoning was based upon many unfortunate experiences suffered by non-Federal irrigation districts in Montana during the depression days. These people were simply afraid to place their land in a position where it could be assessed for the payment of any possible delinquent charges. In Montana this is referred to as the "last honest acre" rule--it makes all members of an irrigation district liable for the delinquencies of others.

Although a Federal irrigation project had never failed, we were unable to remove this objection from the thinking of the farmers and ranchers who already had a water supply but an erratic one. If it meant forming an irrigation district in order to provide a regulated and assured water supply, they preferred continuing with their present vagaries. Out of this seeming chaos developed one of the most unique arrangements ever entered into in the formation of a Federal irrigation project. The landowners who would receive supplemental water from the development filed articles of incorporation with the Secretary of State for the Clark Canyon Water Supply Company. For the first time, the corporate law of the State of Montana was invoked in the field of irrigation repayment for the purpose of contracting with the Bureau of Reclamation.

This plan of operation involved issuance of three classes of stock. Class A was reserved for those who had water rights which allowed a full water supply. These were persons who did not need regulation because they held early water rights--those filed before 1870. Fully paid-up stock in this classification was issued at a par value of $10 a share. For just a moment I would like to hesitate and call your attention to the fact that these people had little to gain, but in the deep-

set interest of solidifying the economic future of the Beaverhead Valley, they accepted stock in the company. In this almost unparalleled act of cooperation, these same people agreed to limit their use of water to four acre-feet annually.

Class B stock was issued to those who required supplemental water in order to properly carry out irrigation of their land. The acreage included in this class were better class lands of the project, but requiring supplemental water for full production. Each share of this type stock cost $58 and entitled the owner to one acre-foot of supplemental water annually.

The third category was Class C stock. This was issued for lands of the project that were classed as good, but less desirable than the better classes; therefore, the ability of the farmer to repay was not as great, and although entitled to the same amount of water, the stock was only $20 a share.

A big question to be decided in the formation of this corporation was--how many shares does each person and landowner have to buy? Here again, the technicians of the Bureau arrived at the answer. It was decided on a hydrological basis. As the value of water rights diminished, the number of shares required by an individual increased. The answer was arrived at by employing a hydrograph which verified the point in an average year that each water right would be shut off.

While this organization presented a novel approach to supplemental water supply contracts, the Bureau of Reclamation still required the formation of an irrigation district for the new lands of the unit. In accordance with Montana law, 60 percent of the landowners controlling at

least 60 percent of the land to receive water for the first time, filed a petition in the District Court requesting organization of the East Bench Irrigation District.

The big difference between the two organizations that were formed--the Clark Canyon Water Supply Company and the East Bench Irrigation District--was the fact that those forming the company already had some water rights and those forming the irrigation district did not. Although those who had rights preferred tolerating the irregularities of the flow of the river rather than enter into a irrigation district, they were still willing to enter into formation of a corporation or into some legal organization that would remove obstacles blocking the development of the water resources in their valley.

The responsibility for repayment to the United States Government is divided between the East Bench Irrigation District and the Clark Canyon Water Supply Company. Each has entered into a repayment contract with the United States calling for payment of the reimbursable costs assigned to it in forty annual installments. The irrigation district raises the money it is required to pay the United States annually by assessments against its irrigable lands. The Clark Canyon Water Supply Company pays its annual installments with monies received by it from the owners of its Class B and Class C shares of stock.

There were at least four additional problem areas involved in the development of the East Bench Unit which I would like to call to your attention. One such area was that of right-of-way reservations. The Act of August 30, 1890, reserves a right-of-way of canals and ditches constructed under the authority of the United States in all patents thereafter issued for lands west of the 100th meridian. As a result of

this Act, owners with titles deriving from a patent issued subsequent to August 30, 1890, were compensated only for improvements or crops damaged or destroyed when a reclamation canal crossed their property. Owners of land east of the 100th meridian, however, or owners of land west of the 100th meridian patented prior to August 30, 1890, were compensated fully for their land in a similar land taking.

Although the legislative history of this section of the 1890 Act is very sketchy, it is clear that the Congress did not contemplate the construction of canals of the magnitude of those being built today or the long distances over which water is now being conveyed. Seventy years ago, when the reclamation program was getting underway, a right-of-way of 75 or 100 feet in width was normally the maximum that was required. Today, however, on at least one section of the main canal of the Garrison Diversion Unit in North Dakota, about 1,400 feet of right-of-way width is required. Also, canals today frequently pass through and cause severance damage to lands that are not benefited in any way by the canals or by the project of which they are a part.

To a greater or lesser degree, many of these problems were encountered on the East Bench Unit. But it was not until September 2, 1964, some eight years after we first opened our Project Office at Dillon and with the construction of the Project fully completed, that we had available to us the authority of Public Law 88-561. This law provides for the payment of compensation for the rights-of-way acquired by the United States for Federal reclamation projects without regard to any reservation under the Act of 1890. The provision thereof being retroactive to January 1, 1961, we went back to the East Bench landowners concerned and made the necessary adjustments in our right-of-way compensation.

The 160-acre limitation was another problem. The Bureau of Reclamation has been required by the Congress to limit the delivery of irrigation water to any one owner to not more than 160 irrigable acres. Application of this limitation to the East Bench Unit presented another complication. The combination of high altitudes and short growing season of the area made it practically impossible for the farmer to operate successfully with such small acreage.

Application of the 160-acre limitation was further complicated by the fact that 28,000 acres of the valley lands had established water rights. The irrigation of these lands without the benefit of streamflow regulation had resulted in short periods of excessive water use followed by insufficient supplies. In exchange for a regulated water supply, these landowners would have to give up part of the water they had been diverting to provide a supply for the 21,800 acres of dryland bench area. Obviously, they were not about to do this if it involved reducing their holdings to comply with the 160-acre limitation.

After hearing the testimony, therefore, the Congress enacted in 1957 legislation which (1) exempted the ownerships consisting of valley lands only, and which (2) provides that with respect to the benchlands or a combination of bench and valley lands, water could be delivered to single ownership of 160 acres or the equivalent of 130 acres of Class 1 land, whichever is larger. The formula which equates the various soil conditions in terms of equivalent productivity of Class 1 land is set out in the legislation.*

---

*Section 2 of Public Law 85-112 approved by the Congress of the United States on July 24, 1957, reads: "In computing 'the equivalent of one hundred and thirty acres of class 1 land' ...each acre of class 2 land shall be counted as thirteen-fourteenths of an acre if in the valley and as thirteen-sixteenth of an acre if on the bench, each acre of class 3 land shall be counted as thirteen-seventeenths of an acre if in the valley and as thirteen-twenty-seconds of an acre if on the bench, and each acre of class 4-P land shall be counted as thirteen-forty-fourths of an acre."

Another interesting fact in the development of the East Bench Unit was the disposition of State-owned lands in the area. Nearly all of the lands included in the East Bench Unit that were to receive supplemental water were privately owned, but only 57 percent of the land on the bench above the valley, which were the new lands and would receive a full supply of irrigation water, was privately owned.

Although Congress had responded with the Act of July 24, 1957, relieving the formerly irrigated valley lands of any acreage restriction and permitting water to be delivered on the newly irrigated lands on the bench for 160 acres of Class 1 lands or for the equivalent of 130 acres of such lands, the Montana Codes provided that no person or corporation could purchase more than one section of State lands and this could not include more than 160 acres of land susceptible to irrigation. To take advantage of the Federal act, the State Legislature, in its 1959 session, amended the State law to provide that the limitation on the sale of irrigable land does not apply within a Federal irrigation project wherein the Congress of the United States has authorized water to be furnished to an area exceeding 160 irrigable acres. Thus, with the cooperation of the Federal Congress and the Montana Legislature, this hurdle was also cleared.

Following this action, 57 farm units in this area containing 22,144 acres of land were sold at public auction by the State of Montana in November, 1963. Of this total acreage, 405 acres were owned by the Northern Pacific Railroad and were appraised and sold at the same value as State lands. The land had previously been leased by the State and Railroad to individual operators as grazing land. About 10,000 acres of the land auctioned off are irrigable and within the East Bench Irrigation District.

It was also possible to develop the water resources of Red Rock River to the maximum practical extent because of the purchase of Lima Reservoir shares by the Water Users Irrigation Company of shares held by the water users under the East Bench development.*

In addition to various factors I have discussed, there were also the usual project right-of-way requirements for the dam, reservoir, and all of the other features of an irrigation system. These, of necessity, bring about a major change in the ownership and use of many landholdings of long standing in the community. On the East Bench Unit this involved, in addition to the usual right-of-way requirements for project installations, the relocation of thirteen miles of railroad, eighteen miles of power transmission lines, sixteen miles of telephone lines, nine miles of U.S. and Interstate Highway, all--I repeat-- all buildings and property in the small town of Armstead.

Let me say that with a stable supply of irrigation water available, the residents of the East Bench Unit can now plan sound long-range programs and thus continue to grow and prosper. The physical features of Clark Canyon Dam and Reservoir, constructed by the Bureau of Reclamation, which will serve the 49,800-acre East Bench Unit, dramatically represent the aspirations of this community in the full use of its water resources. They are the means whereby the irrigators in the Beaverhead Valley and on the East Bench can be assured of an ample supply of water and worry less about flood damage and ice jams. Please permit me to review the major features of this unit.

---

*19,555 (26.8%) shares of stock of the Water Users Irrigation Company, out of a total of 73,055, are held by 34 owners below Clark Canyon Dam and were purchased by the company at a cost of $5.00 a share.

Clark Canyon Dam on the Beaverhead River is an earthfill structure 113 feet high above streambed, and is about 2,500 feet long at the crest. The dam has a volume of 1,874,000 cubic yards. Hap Hawkins Reservoir, which has storage capacity of 261,000 acre-feet, extends about five miles up both Red Rock River and Horse Prairie Creek. The lake has a water surface of 6,300 acres.

Surplus water from Red Rock River and Horse Prairie Creek is stored in the reservoir during the winter season and during periods of high streamflow. Throughout the irrigation season, water is released to the river for diversion at the new Barretts Diversion Dam and sixty other existing canals. The diversion dam, eight miles southwest of Dillon, diverts water from Beaverhead River into the 44-mile-long East Bench Canal serving 21,800 acres located on the bench above the irrigated valley. The dam also bypasses water for most of the 28,000 irrigated acres in the valley.

Irrigation is the major purpose of the East Bench Unit, but other benefits include flood control, fish and wildlife conservation, all nonreimbursable functions, and recreational opportunities.

Recreation has become well established. The Barretts Diversion Dam public-use area and three lakeside recreation areas are in use. For years, fishermen enjoyed many a catch of rainbow and brown trout in Red Rock River, Horse Prairie Creek and nearby streams, and now the new lake is a mecca for hundreds of anglers and boaters.

I have brushed over the difficulties encountered in bringing this project to reality, but even so it is readily obvious that these problems would be more than many people would attempt to solve; however, I

have pointed out that these were a determined people. Finally, the hopeful years have become a reality--the area now has an assured and ample supply of water. The years of concerted efforts by farmers, businessmen, civic leaders, and the Bureau of Reclamation in this spirited and cooperative venture have been successful. It was a joint undertaking that eliminated individual differences and opinions resulting in a most amazing demonstration of cooperation that brought the precious land and water resources of an area together to form an effective, beneficial and stabilizing factor in the economic pattern of the Beaverhead Valley.

Harold E. Aldrich
Regional Director
Region 6
United States Bureau of Reclamation
1964-1973

HISTORICAL DEVELOPMENT OF WATER POLLUTION CONTROL IN MONTANA

Water pollution has occurred in Montana and elsewhere since probably the beginning of time. The buffalo herds when they crossed a stream would stir up a lot of mud. Later the cattle herds would do the same thing. Miners with their dredges and various placer mining arrangements muddied the streams. In this paper, I propose to tell the story of water pollution from the time the State Department of Health was first organized and the Board of Health appointed; particularly, as it reflects upon the health of humans.

The first Act written to control water pollution was passed by the Tenth Legislative session in 1907. This was considered a good water pollution law when it was passed. The legislature, however, immediately limited the Board of Health activities by not providing funds to carry out the intent of the legislation. Furthermore, the Board of Health activities were greatly restricted by legal opinions limiting the application of the law only to streams where municipal drinking water was taken and where ice companies cut ice for sale.

The Board of Health at this time had two paid employees--the executive secretary and his clerk. Despite these restrictions, the executive secretary with assistance donated from faculty members of the State College at Bozeman and the University at Missoula endeavored to make the law function. One of the early confrontations developed in 1910 when the executive secretary notified all municipalities that were discharging wastes into streams, used further downstream for drinking water or making ice, that they must treat the sewage before discharge. The reaction to this directive was an amendment to the 1907 legislation

by the 1911 session amending the law so that the Board of Health was required to prove that the sewage from a particular municipality was harming downstream water users. By 1919 the pollution problem at Chinook had become so serious that a Blaine County legislator managed to have passed legislation rescinding the 1911 amendment.

One of the early problems was the need to measure the extent of pollution and the quality of the water in wells and streams. This led to the establishment of a laboratory at Montana State College in Bozeman with W. M. Cobleigh, professor of chemistry, being made the first director of the Water and Sewage Division for the State Board of Health. He was assisted by D. M. Swingle, professor of bacteriology. This was in addition to the teaching duties of both of these men. These men enlisted other faculty members to work with them and also managed to employ students in the laboratory. During this time, Cobleigh made many field investigations, both with the Executive Secretary of the Board of Health and by himself.

One of the young bacteriologists on the faculty who worked with Cobleigh and Swingle was H. B. Foote. He also did special investigation work during the summer season. His work apparently was quite outstanding and it was arranged for him to take special graduate work in the field of sanitary engineering at Harvard University. Upon his return, in 1923, he was named Director of the Division, with Cobleigh becoming Consultant to the Division. The Division with the laboratory, was then moved to Helena. Foote had a clerk and an assistant. His assistant did field and laboratory work.

In addition to the laboratory work done by these two, inspections were made of all municipal drinking water supplies at least annually.

The extent of this task is apparent when it is realized that most of the work was done by train travel supplemented by horses and cars, as they were available.

In 1945, the water pollution legislation was amended to protect and preserve the rights of individual water users in addition to protection of public water supplies. This greatly changed the Board of Health's approach to pollution enforcement in the State.

In 1949, the Board of Health was authorized by legislature to receive federal funds to improve its water pollution program and the federal government authorized aid to municipalities to plan and construct waste treatment plants.

The Board of Health recognized a general change in the attitude of Montana citizens in 1952 and officially adopted a policy requiring primary treatment of all wastes before discharge into any watercourse in Montana. At the same time, various groups were organizing in an effort to have comprehensive water pollution legislation. The legislation was finally passed in 1955 after municipalities, wildlife groups, Board of Health and others managed to write a bill that was endorsed by the predecessor of the Exxon Company of Billings. This led to the endorsement by other industries and the adoption of new legislation. The legislation provided for a Water Pollution Control Council to enforce the law through the Board of Health staff. This was changed by State reorganization in 1971 when the Water Pollution Control Council became an advisory group to the Board of Health. The 1955 act has been revised, modified and improved by amendments in 1971, 1973 and 1975. The Board of Health can now require proper operation of waste treatment plants and can impose fines of up to $10,000 per day for non-operation

of a treatment plant or the discharge of wastes into a stream.

When the Board of Health was first organized, confrontations involving water pollution were experienced in one place or another. Almost each city in the State could tell a story of its problems with water pollution. The problem that was the longest running started in 1902, the year the Board of Health was organized, and was not completely solved until 1975. This was the Milk River pollution problem, primarily involving the discharge of sewage from Havre and its effect on the Chinook water supply.

The groundwater in the Milk River valley between Havre and Harlem is generally highly mineralized and unsuitable for human consumption. In 1902, the city of Havre began talking about installing sewers and discharging the wastes untreated into the Milk River. This was the drinking water supply for Chinook, Harlem and many of the people living along the river. Complaints were filed with the Board of Health, despite the fact the Board had no authority in this area.

Because of these complaints, Dr. Thomas Tuttle, the Executive Secretary of the Board, and Emil Starz, a Helena chemist, traveled to Havre where they rented a horse and buggy. Between Havre and Chinook on both sides of the river they interviewed and obtained sworn statements from those living along the stream. Their questions to these people pertained to their source of drinking water, where they watered their cattle, irrigation of crops, washing of milk pans, their production and sale of milk, in addition to their observations relative to stream flow and whether or not the stream had ever dried up.

From this visit, they learned that the stream did dry up upon

occasion, but almost annually the flow was so small that at times one could jump across it. In their travels, they noted barnyards draining into the stream, manure piles along the stream and many dead animals. Their conclusion following this inspection was most interesting, as we view it today, since they determined that when a stream was low or dry, there was considerable filtration of the water through the river sands; thus, purifying the water. When there were large flows, the water was purified by dilution. It appeared to these men that some extra sewage from Havre would be of little additional burden to the stream and would not be noticeable at Chinook, as compared with other sources of pollution. At this time, Havre had a population of 3,500 and Chinook of 800.

Since other municipalities were discharging raw sewage in streams and there was no law, there was little that the Board of Health could do about this. As a result, the sewer was apparently installed.

When the 1907 law governing water pollution was passed, the Board of Health also received authority to review and approve plans for all water and sewer lines that would be installed in any municipality. When the city of Havre applied in 1909 for a sewer extension, it was approved with the understanding that a purification plant would be installed when called upon. They were called upon in 1910, as were many other cities in the State, to install sewage treatment and have it in operation by October 1, 1911. That is when the 1911 legislative session amended the law taking away from the Board of Health such authority unless they could prove that the sewage from a particular municipality was causing an illness downstream. At this time the the State Health Officer stated that the Board of Health must quietly wait until sewage caused a few or

many deaths, before action could be taken and then must prove that the deaths were directly the result of the particular sewage in question, a proof that is practically impossible to obtain.

A typhoid epidemic occurred in Chinook in January of 1914 and Chinook was ordered to install a water filtration plant and chlorinate its drinking water. Also in 1914, Havre requested approval of another sewage system to serve an area of the community that the existing system could not serve. Since an Imhoff tank was provided for the treatment of the wastes, the system was approved.

Because of the pollution problem at Chinook, Representative James Griffin of Blaine County, in 1917, introduced legislation that would remove the 1911 amendment to the water pollution act. This would clear the way for the Board of Health to take action against Havre.

In April of 1917, the Board of Health ordered Havre to place the Imhoff tank on the new sewer system into operation at once (apparently it had been installed and bypassed). Also the Board ordered Havre to take immediate steps to install sewage treatment.

Consulting engineers were employed by Havre in June of 1917 to investigate and determine a plan to carry out the Board of Health orders. Because of lack of action, the Havre mayor and the consulting engineer were summoned to appear before the Board of Health in October 1917. They presented excuses and reasons for not progressing. Dr. W. F. Cogswell, the Executive Officer at that time, threatened drastic action, unless immediate steps were taken to comply with the Board of Health order. In January of 1918, Dr. Cogswell requested that the Montana Attorney General, Sam C. Ford, who was later governor, begin

legal action against Havre. In April, he informed the Board that the city was doing its utmost to comply with the order. At the same time, the War Industries Board directed that all new undertakings not contributing towards winning the war, should be discouraged. Dr. Cogswell, because Havre had made many promises and not carried them out, wanted the order enforced, but nothing was done.

In December of 1918, the Chinook Town Council and Blaine County Commissioners requested the Governor to enforce the law concerning Havre. This was followed by the opinion from the Attorney General, that the 1917 Board of Health order was defective. Therefore on January 13, 1919, the Board of Health issued a new order with a deadline of May 1, 1919 to begin installation of sewage treatment. Havre did not reply to this order, so on May 2, this was taken up with the Attorney General, who filed action against Havre in the District Court in August of 1919. Havre replied by requesting that a survey commission be appointed and that W. M. Cobleigh be named chairman of the commission. Havre agreed that it would follow the recommendations of the commisson. The commission recommended sewage treatment and bonds were prepared but when placed on sale in June of 1920, there were no bidders. When the bond market improved, the Board of Health issued another order for Havre to proceed. This was followed by much delay. Apparently the costs had risen so much that it was not until April of 1927 that another bond election was held. The bond election was defeated with 44 voting in favor and 227 against the issuance of bonds (it was by hearsay that it was learned that the Havre City Council members campaigned against this bond issue).

When this bond election lost, the Board of Health asked the Attorney General what could be done as the next step against Havre. He

informed the Board that they could do nothing further. As a result, the Board, in their effort to prevent further pollution of the Milk River refused to approve any further sewer extensions for the city of Havre.

The Board was stopped in their action against Havre because of Havre's lack of funds. The Board looked for some other means to finance the construction of sewage treatment facilities, since bonds were the only method provided by State law. Some of the other states had been successful in using "Sewer Rental." To develop interest for legislation authorizing sewer rental, a public meeting was called in Havre in 1928, just prior to the 1929 legislative session. In attendance at this meeting were citizens of Havre and the Milk River Valley legislators. The legislature passed the "Sewer Rental" law, but Havre did nothing.

Discussion with individuals living in Chinook at this time tell of Chinook trying to force Havre into action by an economic embargo and the people in Chinook refusing to buy in Havre. This went on for several months and just about the time Havre was about to capitulate, the people in Chinook called off the embargo. Chinook announced at this time that they would proceed with sewage treatment when Havre did. Some Federal funds became available in 1933 for sewage treatment, but Havre would not accept these funds and Dr. Cogswell declared Havre an "Outlaw City."

Harlem, in the spring of 1934, brought charges against Havre through the Board of Health. In April of 1934 the Board again ordered Havre to treat its sewage. Havre citizens then presented a petition to the City Council requesting a bond election to pay for the construction of a sewage treatment plant. The council unanimously voted to temporarily delay action on this petition; yet in October 1934, the council

called for a $64,000 bond issue to construct a city gas system. This was defeated by the electorate. In the meantime, the Board of Health continued to refuse to approve any extensions to the city's sewers.

At the same time that this sewage treatment discussion was going on, the Bureau of Reclamation was developing plans to construct a dam on the Milk River above Havre to equalize the flow available for irrigation downstream. There were several groups interested in purchasing additional capacity in the reservoir to maintain a minimum wintertime flow. Both industries and municipalities joined in the effort to raise money for this purpose and while the Board of Health recommended a minimum flow of 100 cubic feet per second to dilute Havre's sewage, the money available only provided a minimum winter flow under the bridge at Havre of 25 cubic feet per second. This was a great improvement over the zero flow frequently encountered at this point, except for Havre's sewage.

Following World War II, Federal funds became available so that cities could develop engineering reports leading towards sewage treatment. Havre took advantage of this and on the basis of the initial report, a bond issue of $200,000 was passed to construct a treatment plant; however, another firm was employed in 1946 and they claimed there were insufficient funds for both the primary and secondary plant. As a result, only a primary plant with separate sludge digestion was constructed. However, in order to protect the stream, the Board of Health insisted that the effluent be adequately chlorinated to reduce the organic matter to a level equivalent to secondary treatment. The plant was placed in operation of July of 1950. A secondary treatment plant using activated sludge treatment was placed in operation in 1975.

It is recognized that in 1902 scientific knowledge had not progressed to today's level relative to sewage treatment, but there was information available and used by many cities to provide the equivalent of good primary treatment by today's standards. Havre, through various legal loopholes, managed to evade the law for 48 or 73 years, depending upon how one looks at it. An overview at this time certainly shows Havre did not meet its responsibility and our Montana legislature was negligent in not providing legislation that would prevent such situations. Many typhoid cases and deaths in the Milk River Valley would have been traced to Havre sewage if adequate testing methods had been available. The Board of Health through many years recommended to the legislature that the laws be amended and that money be made available, but the legislature did not see fit to give the Board this authority or the money. Little was accomplished until massive public reaction and Federal legislation brought the State to a position where it could act more forcibly.

As a side issue, Chinook constructed a sewage plant in 1948 and Harlem an activated sludge plant in 1949.

In 1926, a beet sugar refinery was constructed at Chinook, discharging its wastes into the Milk River and further aggravating the water pollution problem at Harlem. Because of complaints, the sugar factory removed its strongest wastes, but continued to discharge large quantities of a much weaker material into the stream. This weak waste also created problems. When Harlem brought action against the sugar company through the State Board of Health, the sugar company constructed a water storage reservoir sufficiently large to supply Harlem with water at its water plant during the winter months when the sugar factory was

was in operation. This temporarily solved the problem. The problem was completely solved shortly after World War II when the plant was completely closed down and moved.

All of the Board of Health problems were not related to the Milk River valley area and they did manage to solve some under the existing law. One of the early cases involved Miles City, which installed its first sewer system in 1897. The untreated waste was emptied into a slough that drained into the Yellowstone River. During high water there was a flow in the slough, but during the low water the undiluted sewage collected in the slough. Because of the odorous condition, the city decided to move the point of discharge to the main stream of the Yellowstone. Downstream, Glendive took its drinking water from the Yellowstone and requested the Board of Health to take action to stop Miles City under the 1907 act. Miles City claimed they had prescriptive rights to discharge because of long usage. The District Court upheld this opinion, but when the case was appealed to the State Supreme Court, the District Court was reversed and the Supreme Court stated in part as follows: "...that hereafter no polluting sewage and no human excrement shall be discharged into any stream which is the source of water supply for any city or town, until such deleterious matter is rendered harmless by some means of purification acceptable to the State Board of Health." In 1910, Miles City began treating its sewage by settling and sand filtration. At about the same time, the cities of Missoula and Glasgow, in abiding by the law, submitted plans for discharge of raw sewage into rivers at their respective locations. The Attorney General informed the Board that it must permit these discharges, since there were no cities or towns downstream using the water for drinking or ice companies cutting ice from these waters.

As we know it today, early methods of sewage treatment were very limited. The usual methods consisted of settling basins, septic tanks, and Imhoff tanks, followed by filtration, often in natural sand beds. Most methods required little or no maintenance or energy. A good operation consisted of annually removing the solids that had collected in the tank or basin. As a result, the filters were soon clogged and the effluent from the tank ran directly to the receiving stream with little or no treatment. This may have been better than no treatment, which was the situation in many of the larger cities; however, the basic problem was the lack of forceful legislation requiring treatment and lack of means to provide the funds for proper plant operation. The person responsible for operation of the sewage treatment plant was often required to operate the water system, grade streets, care for stray animals, serve as town marshall, and possibly open graves.

The first mechanical plants in Montana were constructed in the 1930's when Public Works funds became available. These were in Lewistown and Kalispell. These first mechanical plants brought the new treatment methods to Montana. They are still in operation today with added improvements. After these first two plants were constructed, the Board of Health ordered certain other communities that had bad situations to construct sewage treatment facilities, but control of materials during World War II delayed the construction.

The 1907 legislature authorized the Board of Health to establish experimental sewage treatment plants. With little or no funds, this seemed practically impossible. In 1913 the Board obtained funds for

such a plant. It was constructed at Bozeman, with the Board constructing the plant, the city of Bozeman operating the plant and Montana State College faculty planning the studies and doing the analytical work. The plant consisted of screens, septic tank, contact and sprinkling filters, and a sand filter that could be operated with various combinations. Calcium hypochlorite was used for disinfection. The study was to include simple screening and disposal by dilution. It was intended that the information provided by the plant would aid in developing general policies governing sewage disposal in Montana. There is nothing in the records to indicate what happened at this plant, other than having it established.

Another problem was faced our early workers. This involved Professor Cobleigh who, in 1909, was studying an outbreak of typhoid fever at Laurel, Montana. Cobleigh at that time was a very young-appearing man, quite short, with dark hair. He had collected two demijohns of water at Laurel and was getting on the train to take them to Bozeman for testing. On the train was Carrie Nation who observed this young man apparently bringing liquor on the train. She promptly got out her hatchet and attacked the demijohns breaking both sample containers.

Water pollution has been a recognized problem in Montana since the early 1900's. The State Board of Health was given the responsibility for enforcing the legislation but no funds were provided for personnel or activities that were authorized by the legislature. The Executive Secretary for the Board was responsible for water pollution enforcement as well as his many duties in the medical field including spotted fever studies and epidemiological work.

The construction of sewage treatment plants and their operation was looked upon as non-productive by both municipalities and industries. It required the combined efforts of all that were harmed by the wastes to convince the legislators and others that an effective law was needed. This was finally passed in 1955.

State legislation combined with federal grants and effective federal laws made possible the elimination of all untreated municipal and industrial waste from Montana's streams. New legislation requires proper operation of these treatment plants and can impose fines of up to $10,000 per day for non-operation of the treatment plant.

The state budget for water pollution control has gone from nothing in 1907 to the present 1.1 million dollars per year. The staff has expanded from a single multi-dutied health officer with donated assistance to thirty-four persons in Montana, and Federal staff assistance as needed.

It has been a long struggle with many dedicated persons giving much more than an eight-hour day to come as far as it has. Apathy, a desire to consider other programs more productive, and lack of understanding by the citizens made water pollution a step-child that is just now coming into its own.

Claiborne W. Brinck
Director of the Division of
Environmental Sanitation
of the Montana State
Department of Health
1951-1972

COMMENTARY

The papers presented this afternoon, both collectively and individually, make significant contributions to historical knowledge, especially in what they tell us about Montana's attempts to grapple with its physical and human environment. But these papers are much more than just good history, for they are also valuable first-hand accounts by men who know personally whereof they speak and who helped make much of the history they describe. Thus, their accounts possess the unusual distinction of being good traditional history as well as valuable source material for future historians.

Though each of the papers deals with a different series of events and cast of characters, they have a great deal in common, especially in the way they serve as case studies, telling us by implication as much about the West in general as they do about Montana in particular.

Each of these papers, for example, reminds us that there have always been men somewhat in advance of their time--the leaders and planners, the people with imagination. The price that these people often pay is to be ignored, sometimes for far too long. As Dr. Fabrick demonstrates, years before the crisis of the Great Depression there were plans for effectively developing much of Montana's water resources; and Mr. Aldrich affirms this in his discussion of the Three Forks area, just as Mr. Brinck makes the same telling observation in his discussion of the struggle to control pollution.

The papers also forcefully remind us that neither the history of Montana (nor the history of any part of the West, for that matter) can

be written without taking into account events elsewhere. There can be no really good local or State history that fails to reflect critical outside influences, especially those in Washington, D.C. As Dr. Fabrick notes, Montana had the desire to develop its water resources during the depression and it even had the stimulus of a drought to heighten that desire--but it also had an army of unemployed people and little money in the State treasury. The way out was found through cooperation with outsiders and also cooperation among those at home. The outsiders took the form of the PWA, the WPA, the President's Drought Committee, the U.S. Forest Service, and others. Mr. Aldrich reminds us--as if we actually needed reminding--that perhaps the most significant of those outsiders has been the Bureau of Reclamation; and Mr. Brinck graphically illustrates how the infusion of Federal funds and regulations during and after World War II helped the State Board of Health carry out its mandate, a mandate that had been frustrated by parsimonious State legislatures and by attempts of both cities and businesses to avoid the consequences of their own pollution.

But cooperation with outsiders is only part of the story, for Montanans also had to learn to cooperate with one another in new ways. As Dr. Fabrick observes, the Water Conservation Board wisely placed most of the responsibility for management in the hands of local water-user organizations, a decision that prevented the growth of an unnecessary bureaucracy and promoted efficiency. Mr. Aldrich shows how ranchers and farmers worked together (and with the cooperation of others on the State and Federal levels) to pioneer solutions to problems involving the distribution of costs, status of water rights, the 160-acre limitation, compensation for rights-of-way, and other difficulties. Mr. Brinck

illustrates the benefits to health that followed from cooperation between the State and college (now the university) at Bozeman. He also dramatically illustrates the price for failure to cooperate by noting the tragic consequences of the "Great Sewer War" between Havre and Chinook.

I came away from all three papers thinking that the theme of each could easily become a book, and I hope each will be. In part, I say this because I suspect that there is a great deal more that each speaker could tell us about the infighting, the failures, the clash of personalities and policies and philosophies that went into producing the kinds of programs described here. I know these men have been modest in describing their own roles and the obstacles they faced in orchestrating the kind of cooperation that they achieved. I also wonder if at some time in the past they might not have been at loggerheads with one another. If not, I suspect their successors may be. On the lower Colorado River, for example, those advocating the development of water resources and those advocating stricter pollution regulations are coming increasingly into conflict. Part of the reason is that many of the devices that help to make water available for use--e.g., the dams and canals--can also contribute to increased pollution. A case in point is the evaporation from reservoirs, which can often be staggering; six feet annually from Lake Mead and Lake Powell--that is, six feet of water right off the top of those lakes that never returns to the system. This evaporation, together with increased water use for irrigation, has meant increased levels of salinity, which in turn has contributed to crop damage, corrosion of metal pipes and heaters, added soap consumption, more expensive treatment of water for drinking and industrial purposes, increased

water-softening costs, expensive tiling of fields, and the need to apply more water to grow the same crops that were produced with less water a few years earlier.

But the point on which I want to conclude is the unusual value of papers such as these. They should be preserved; they should become books. At the very least, the Montana Historical Society, or one of the state universities, or some sort of consortium should arrange to interview men like Messrs. Fabrick, Aldrick, and Brinck. Their recollections are too valuable an historical source to pass up.

Norris Hundley, Jr.
Professor of History
University of California at Los Angeles
and Managing Editor to the PACIFIC
HISTORICAL REVIEW